REMARKS

Favorable reconsideration is respectfully requested.

The claims are 17-25 and 27-31.

The above amendment is presented to clarify that the presently claimed compositions and formulations are pressure-sensitive, radiation curable adhesives, a highly specific application, which application unobviously distinguishes them from the prior art, as will be discussed below.

Support for this amendment is evident throughout the specification e.g. page 5, lines 27-29.

Previously, claims 17-29 were rejected as obvious over Norlin et al. (US 2002/0099110).

This rejection is again respectfully traversed.

Norlin discloses radiation curable coating compositions containing backbones derived from polyols used either singly or in combinations of two or more [0012]. When multiple polyols are used, they can be linked by different means including urethane linkages [0014]. The compositions are used as coatings having improved release properties or as optical fibers coatings having good spooling properties [0008].

On the other hand, the radiation curable adhesive formulation of present claim 17 is a radiation curable, pressure sensitive adhesive formulation comprising a urethane (meth)acrylate polymer and a tackifier. It requires a weight ratio of rubber-derived polyol to acrylic-derived polyol from 0.1 to 10 and the urethane (meth)acrylate polymer is obtained by a two step process. In contrast see Norlin [0029].

The process of claim 22 is nowhere disclosed or suggested by Norlin nor is the product therefrom. See especially claim 31 which specifically recites the product of this process.

In addition, Norlin doesn't teach or suggest any radiation curable formulation comprising a urethane (meth)acrylate polymer and a tackifier to be used as a pressure-sensitive adhesive formulation.

Nor does he teach or suggest any specific process to obtain the urethane (meth)acrylate polymer nor any weight ratio of one polyol to the other to be used to obtain the desired radiation curable oligomer.

The presence of acrylic and rubber polyols residues in the oligomer backbone in the relative amounts, as presently recited, leads to an unexpected combination of performances for

use as radiation curable pressure-sensitive adhesive (page 12, lines 12-24, page 13, lines 20-23 or from the test results of Examples 7 and 8 (page 38, lines 9-11)).

Submitted herewith is a Declaration by Zhikhai Wang, the first named inventor herein supporting the above-discussed points.

As set forth in the attached Declaration, the present invention is suitable as a pressure sensitive adhesive, but is unsuitable for coatings or adhesives (sealant/sealer).

According to Wikipedia, the definitions of coating, adhesive (sealant/sealer) and pressure sensitive adhesive (PSA) clearly indicate that the material requirements for these 3 different applications are essentially and significantly different.

To meet the "pressure-sensitive" requirements herein, the PSA materials have to be both **viscous and elastic**. In a normal case, a viscous property will positively impact the adhesion performance while negatively affect any cohesion performance. On the contrary, the elastic property of the material provides cohesion performance while reducing adhesion performance. Obtaining a proper balance between the viscous and elastic properties is the key factor to achieve a high performance for a PSA product.

To arrive at the present invention, almost all of Applicants' technical efforts focused on pursuing a good balance between viscous and elastic properties in the same material system.

In order to be "viscous" at the application process temperature (normally, room temperature), **a PSA material has a Tg (glass transition temperature) below room temperature (25°C), before and after cure. Under this condition, the material is always rubbery and tacky.**

Neither coating materials of Norlin nor adhesive materials nor sealant materials require this special property.

A coating material could be a liquid (tacky) before cure (hardening), but it should be tack-free solid after cure, as must an adhesive/sealant/sealer product.

The following are definitions of coating, adhesive and pressure sensitive adhesive obtained from Wikipedia:

A **coating** is a covering that is applied to the surface of an object, usually referred to as the substrate. In many cases coatings are applied to improve surface properties of the substrate, such as appearance, adhesion, wet-ability, corrosion resistance, wear resistance, and scratch resistance. Coating involves the application of a thin film of functional material to a substrate,

such as paper, fabric, film, foil or sheet stock. Coatings may be applied as liquids, gases or solids. Coating materials could be solvent-based, water-based or 100% solid (liquid or powder). After coatings cure (harden) the final state of coatings is normally in a **hard solid state**.

This definition of coatings is consistent with the coating applications of Norlin.

An **adhesive**, or **glue**, or **sealant/sealer** is a mixture in a liquid or semi-liquid state that adheres or bonds items together. The types of materials that can be bonded are vast but they are especially useful for bonding thin materials. Adhesives cure (**harden**) by either evaporating a solvent or by chemical reactions that occur between two or more constituents. Adhesives are an advantageous for joining thin or dissimilar materials, minimizing weight, and when a vibration dampening joint is needed. A disadvantage to adhesives is that they do not form an instantaneous joint, unlike most other joining processes, because the adhesive needs time to cure.

A **pressure sensitive adhesive (PSA, self adhesive, self stick adhesive)** is adhesive which forms a bond when pressure is applied to marry the adhesive with the adherend. No solvent, water, or heat is needed to activate the adhesive. It is used in pressure sensitive tapes, labels, note pads, automobile trim, and a wide variety of other products. As the name "pressure sensitive" indicates, the degree of bond is influenced by the amount of pressure which is used to apply the adhesive to the surface. Surface factors such as smoothness, surface energy, removal of contaminants, etc. are also important to proper bonding. PSAs are usually designed to form a bond and hold properly at room temperatures. PSAs typically reduce or lose their tack at cold temperatures and reduce their shear holding ability at high temperatures; specialty adhesives are made to function at high or low temperatures. It is important to choose an adhesive formulation which is designed for its intended use conditions.

Therefore, the compositions of the present invention, which are tacky before and after cure, are not suitable for the coating area or adhesive or sealant/sealer area.

In consequence, one skilled in the art would not consult Norlin to develop a pressure-sensitive, radiation curable adhesive formulation.

In view of the above, amended claims 17-25 and 27-29 are clearly novel and unobvious over Norlin et al.

Further, the claims have been rejected as unpatentable over Acevedo et al. (US 7,189,781).

This rejection is also respectfully traversed.

Acevedo discloses a moisture curable, radiation curable (dual cure) polyurethane prepolymer (column 3, line 39 to column 9, line 46) to be used in a sealant composition. The prepolymer includes a first functional group capable of polymerizing upon exposure to moisture and a second functional group capable of polymerizing upon exposure to radiation. Moisture curable functional groups include isocyanate groups and silane groups (column 3, lines 39-49, column 7, lines 28 to column 8, line 57).

On the contrary, the polymer of present claim 17 doesn't include a second functional group that is capable of polymerizing upon moisture exposure as is clear from Formulas 1A and 2A and hence the formulation based thereon is not a dual cure composition in contrast to Acevedo's.

Furthermore, the formulation of the present invention requires a weight ratio of rubber derived polyol to acrylic derived polvol from 0.1 to 10 in the urethane (meth)acrylate polymer.

As is evident from the present specification, the presence of acrylic and rubber polyols residues in the oligomer backbone in the relative amounts described leads to an unexpected combination of performances for use as a pressure-sensitive radiation curable adhesive (page 12, lines 12-24, page 13, lines 20-23 or from the test results of Examples 7 and 8 (page 38, lines 9-11)).

Further, a person skilled in the art would even not consider a document such as Acevedo relating to dual cure sealant compositions to develop a pressure sensitive, radiation curable adhesive formulation.

As stated above, Acevedo requires a moisture curable functional group which is clearly excluded by the present claims and in particular, new claims 30-31 which are in "consisting essentially of" format. Accordingly, the present claims clearly exclude such moisture-curable moieties.

At an interview on September 15, 2010, the Examiner pointed out that even if "consisting essentially of" terminology is employed, the radiation curable polymer of column 10, lines 25 to 57 of Acevedo is suggestive of the presently claimed polymers. In reply, there is no motivation to add a tackifier to a composition consisting essentially of the radiation curable polymer of Acevedo column 10, lines 25 to 57.

In any event, the presently claimed compositions are unsuitable for the dual cure applications of Acevedo and Acevedo's compositions are unsuitable as pressure sensitive adhesives. See the attached Declaration in this regard.

Lastly, one skilled in the art would not be motivated to combine the teachings of Norlin related to coatings with the teaching, of Acevedo related to dual-cure sealants, for any purpose no less to develop a pressure sensitive radiation curable adhesive formulation as presently claimed. And even if one were to combine both references, he would not arrive at the presently claimed pressure sensitive radiation curable adhesive formulations but rather a coating or sealant with dual cure properties.

Again, see the attached Declaration.

Accordingly, the rejections on prior art are untenable and should be withdrawn.

No further issues remaining, allowance of this application is respectfully requested.

If the Examiner has any comments or proposals for expediting prosecution, please contact undersigned at the telephone number below.

Respectfully submitted,

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